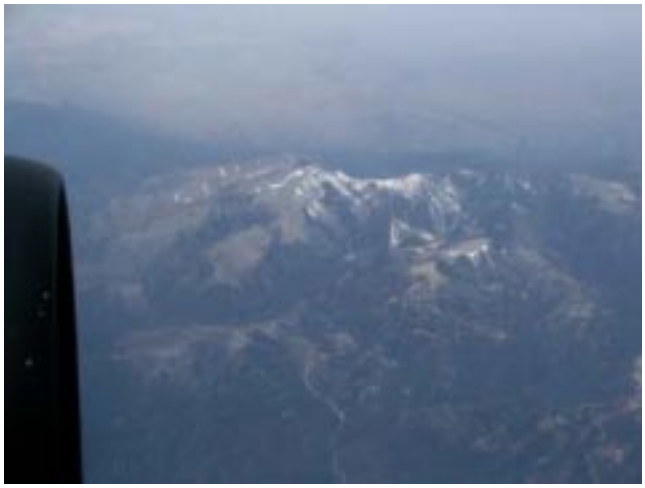
Flight Summary: WB-57F MidCiX – 27 April 2004



Top: Mountains visible at the base of cirrus near the time of the Terra overpass. Bottom: Cloud-top structure over the Gulf of Mexico.

Purpose of Mission: Sample cirrus under EOS Terra and Aqua satellites.

General Information

Flight date – 27 April 2004
Flight description – Flight #4, MidCiX mission, Terra and Aqua Validation
Flight duration – 6 hours
Crew – Rick Hull and Brian Barnett

Weather Observations

- Thick cellular cirrus was observed over west Texas under Terra and in the Gulf of Mexico near the Aqua overpass. Both cirrus events were associated with subtropical cirrus streaming northeastward from a closed low-pressure system aloft situated near Baja.

Flight Profile

- We took off and climbed to FL 490 and didn't penetrate any clouds on the way up. We transited to the west.
- About 16:01, we started over-flying the broken layer of cirrus, 182 miles east of Point A.
- We started a descent into the cirrus layer at 16:18 and at 16:37 were in the cloud tops at FL 370. At this point, every time cloud passed overhead, a dim halo could be seen around the sun (22 deg).
- ATC ordered us down to FL 350 for traffic at 16:55:30, which put us in thick clouds. The sky was heavily attenuated, and the ground was not visible.
- We arrived at Point B at 17:01, and turned north to a point where ATC would allow us to do a spiral. The point was 33:24N, 105:35W. During the initial portion of this leg, we were in very dense cloud with no ground or sky visible about 90% of the time.
- At 17:26, we started a climb to get to the top of the layer. The layer visually stopped about FL 370, but we were getting a lot of counts on CAPS all the way up to FL 398, which we got to at 17:34.
- We started a spiral down at 17:35:20 and started getting counts on CAPS at FL 396 again, but visually looked like we were out of the cloud. We got into the visible wispy clouds at FL 380, and a nice halo was seen with particles streaking through it.
- We laid down a thick, robust contrail at FL 375, and were flying just beneath it in the spiral descent. The right wing may have some time intermittently in the contrail.
- By FL 360, the ground was clearly visible from time to time, and there was no cloud layer beneath the cirrus layer we were in.
- At FL 310, 17:46:15, we were still getting counts on CAPS, but looked liked we were just underneath the cloud layer. ATC would not let us get lower due to hot military areas underneath.
- We started a spiral back up at 17:46:45.
- At 17:53:00, during the Terra over-flight, we were at FL 360 in the top the layer. We were forming a contrail from ~FL 360 – FL 380.
- Again, the cloud layer visually stopped at FL 370, but were getting lots of counts on CAPS all the way up to FL 398, at ~17:58.
- We then climbed on up to FL 490 to transit east.

- We flew back over Houston, and descended down at 19:17 to FL 390. During this descent, the nose gear again showed unsafe in the stowed condition.
- At 19:25, during the Aqua satellite over-flight, we were flying just over the cloud layer.
- We finally got cleared down to FL 350, and got into the very top of the clouds at 19:31. We then descended down to FL 330, which clearly put us in the top of the cloud layer.
- We were in and out of the cloud bands for a while. They ranged from extremely dense to very thin. A very faint halo was seen from time to time (22 deg), but for the most part was not visible.
- This line started off with a very defined top to the clouds, but by 19:45, FL 330, the top had become very undefined and wispy.
- At 19:49, we ran out of clouds and turned 180 and descended down to FL 318. This put us more in the middle of the cloud layer. At 19:56:45, it was noted to be very thick, with no sky or ground visible. This occurred more than at just this time, but this time is representative of what we were seeing.
- We ran out of the clouds at 20:04, and made another 180 and descended down to FL 310. We got back in cloud at 20:07. The ocean was barely visible beneath us.
- We then descended down to FL 280 to start a spiral up.
- We started a spiral up at 20:13:15, from FL 280 and the very bottom of the cloud layer, but were still getting some CAPS counts. There were no clouds underneath our cirrus layer, and no halos were visible.
- On the way up, we started to see the sky at FL 330, and came out of the cloud at 20:20:23, FL 346.
- We then returned to base, and descended back through the cloud layer en \route to EFD.
- No further clouds were penetrated during the descent once we bottomed out the cirrus layer.

Flight Log

Take off	1505 UTC	**Landing**	2100 UTC

Instrument Failures/Notes/Times

- Harvard Total Water did not automatically shut down (or at least did not show a fail light around FL 080), so it was shut down manually at 2,500 feet at 20:50:18.
- MMS Box: Not conducted.
- MMS Pitch: 20:36:17 – 20:37:05, 150 KIAS, FL 100
- MMS Yaw: 20:37:06 – 20:38:08, 150 KIAS, FL 100

Instruments flown: Full Compliment
Preliminary Instrument Notes:

Appears Good:	MMS, CSI, CPI, NEV, SPP, Harvard TW, Harvard WV, CLH, CIN
Problems:	JLH – no science data recorded
	VIPS – no data recorded
	CPI – Corrupted data file for 2nd half of flight – likely recoverable
	PIP/2DP – hardware failure.

Nav Data Information

Nav data is uploaded to the MidCiX website.

Compiled by Brian Barnett and Jay Mace